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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
| 08/673,597      | 06/12/97    | KAYYEM               | J A-64558-17/RF     |

HM22/0614

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EXAMINER

HOUTTEMAN, S

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 1655     | 12           |

DATE MAILED: 06/14/97

Please find below and/or attached an Office communication concerning this application or proceeding.

**Commissioner of Patents and Trademarks**

|                              |                                      |                               |
|------------------------------|--------------------------------------|-------------------------------|
| <b>Office Action Summary</b> | Application No.<br><b>08/873,597</b> | Applicant(s)<br><b>Kayyem</b> |
|                              | Examiner<br><b>Scott Houtteman</b>   | Group Art Unit<br><b>1655</b> |

Responsive to communication(s) filed on Apr 2, 1999.

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

#### Disposition of Claims

Claim(s) 1-34 is/are pending in the application.

Of the above, claim(s) 1-18 is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

Claim(s) 19-34 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claims \_\_\_\_\_ are subject to restriction or election requirement.

#### Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All  Some\*  None of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

#### Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

1. Applicant's response, filed 4/2/99, has been carefully considered with the following effect:

The objection and rejections of paragraphs 2b and 2c, Office action mailed 9/30/98, have been withdrawn in view of applicant's amendments.

The objections and rejections of paragraphs 2a, 3 and 5, Office action mailed 9/30/98, have been maintained.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 19-31 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. There are two recitations of "covalently attached" in claims 19-34. It is unclear whether there are two distinct attachments or only one.

Applicant has amended the claim. This amendment, however, does not identify to what the *oligomer* is attached. The claims recites a first measuring electrode which "comprises" an attached conductive oligomer. The transitional phrase "comprises" makes it clear that the oligomer is one of the components of the "first measuring electrode." The oligomer is "also covalently attached to a nucleic acid." It is clear that in reciting "the attached conductive oligomer" the oligomer must be attached to *something else besides the nucleic acid*. The identity of this something else, however, remains unclear.

b. Claims 26 and dependent claims 27-34 are indefinite in the recitation. "a second nucleic acid comprising a covalently attached electron transfer moiety." This limitation is interpreted to read on a compound comprising (1) a electron transfer moiety and (2) some other component to which the electron transfer moiety is covalently attached. Similar to the rejection above, it is unclear to what the electron transfer moiety is attached. The claims merely recite a nucleic acid in which one component is an electron transfer moiety.

It is unlikely that the claimed "nucleic acid" is made up only of an electron transfer moiety so one assumes that some other component is present, presumably attached to the electron transfer moiety. This unspecified second component is maybe some kind of nucleic acid derivative because entire compound the named "nucleic acid."

Since the nature of the covalent attachment and the second "nucleic acid" component of the nucleic acid compound are unclear, these claims are indefinite.

c. Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 31 is indefinite in the recitation of "R is a substitution group." There is no standard chemical definition of "a substitution group," nor was one found in the specification. It is unclear whether R means: a non-carbon atom, a heteroatom, anything or anything except hydrogen.

4. Claims 19-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Ribi et al., US Pat. 5,571568 (11/1996) filed 6/1995, effective filing date 6/15/89 (Ribi) for reasons of record.

5. Applicant argues that Ribi does not teach “does not outline covalent attachment of anything, much less nucleic acids, to the electrode and that Ribi uses “non-covalent methods” to attach the electrodes onto the substrate.

This argument is not persuasive. The claims are not limited to covalent attachment of electrode to nucleic acid. The claims recite: an electrode which “comprises” an attached conductive oligomer and a nucleic acid covalently attached to the conductive oligomer. The claims do not recite a conductive oligomer attached to an electrode.

Furthermore, the mode of attachment is the electrode in Ribi clearly involve covalent bonds. The critical feature in Ribi is not avoiding covalent attachment but rather to close the electric circuit. For example, Ribi explains that the nucleic acid can be attached with a linker which can take many forms, depending upon its specific purpose. This includes such covalent bonds as suggested in col. 5, lines 45-57. The whole purpose of attaching the nucleic acids is to complete an electric circuit. This is done with a myriad of prior art methods, some of which involve the formation of covalent bonds and some of which do not.

6. Claims 19-34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ribi for reasons of record.

Newly presented claims 26-34 recite various formula for the claimed conductive oligomer and electron transfer moieties. Taking n=1, m=0 and G is a single bond claim 30 reads on a carbon-carbon bond which is present in any nucleic acid, for example, the carbon-carbon bond in

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the ribose sugar ring. Taking R= hydrogen, n=1 and m=0 claim 31 reads on a single carbon-carbon double bond. All of the nucleic acid bases, Adenine, Guanine, Cytosine and Thymine have carbon-carbon double bonds and due to the conjugated heteroatom conjugated ring system they have molecular pi electrons. These pi electrons which travel from atom to atom in the ring systems read on the claimed electron transfer moieties.

Applicant argues that there is no motivation to attach the nucleic acids to the electrode. This argument is not persuasive. Ribi must attach the nucleic acid to the electrode in order to complete the circuit.

7. Applicant's amendment made necessary the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

Papers relating to this application may be submitted to Technology Center 1600 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Technology Center 1600 Fax numbers are (703) 305-3014 and 308-4242.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Houtteman whose telephone number is (703) 308-3885. The examiner can normally be reached on Monday, Tuesday, Thursday and Friday from 8:30 AM - 3:30 PM. The examiner can also be reached on alternate Wednesdays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones, can be reached at (703) 308-1152.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center receptionist whose telephone number is (703) 308-0196.

Scott Houtteman  
June 11, 1999



SCOTT W. HOUTTEMAN  
PRIMARY EXAMINER